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DESERT BIGHORN SHEEP INTRODUCTION AND FOLLOW-UP ON THE VIRGIN MOUNTAINS OF CLARK COUNTY, NEVADA

A Progress Report

by

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NEVADA DEPARTMENT OF FISH AND GAME

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A Cooperative Study by the
Nevada Department of Wildlife
and
U. S. Bureau of Land Management

September, 1979

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FOLLOW-UP REPORT FOR THE VIRGIN MOUNTAIN DESERT BIGHORN SHEEP REINTRODUCTION

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Quarterly Report
September 1979

Introduction

Desert bighorn sheep (Ovis canadensis nelsoni) were recently reintroduced into the Virgin Mountain Range of Clark County, Nevada in an attempt to increase the distribution and abundance of the species in the state. The bighorn were wild-trapped from the River Mountain population through Cooperative Agreement with the National Park Service (Lake Mead National Recreation Area) and released on public domain administered by the Las Vegas District of the Bureau of Land Management. The specific details of both the trapping operation and results of the release have been described in an earlier report.

This Quarterly Report represents the first in a series of documents that is intended to keep all concerned parties updated on the progress of the project. Quarterly Reports will be written for the next two years after which all the available data will be summarized into a final report. The follow-up efforts are a cooperative venture between the Nevada Department of Wildlife and the Bureau of Land Management with the responsibilities of each agency described in a Cooperative Agreement.

Background

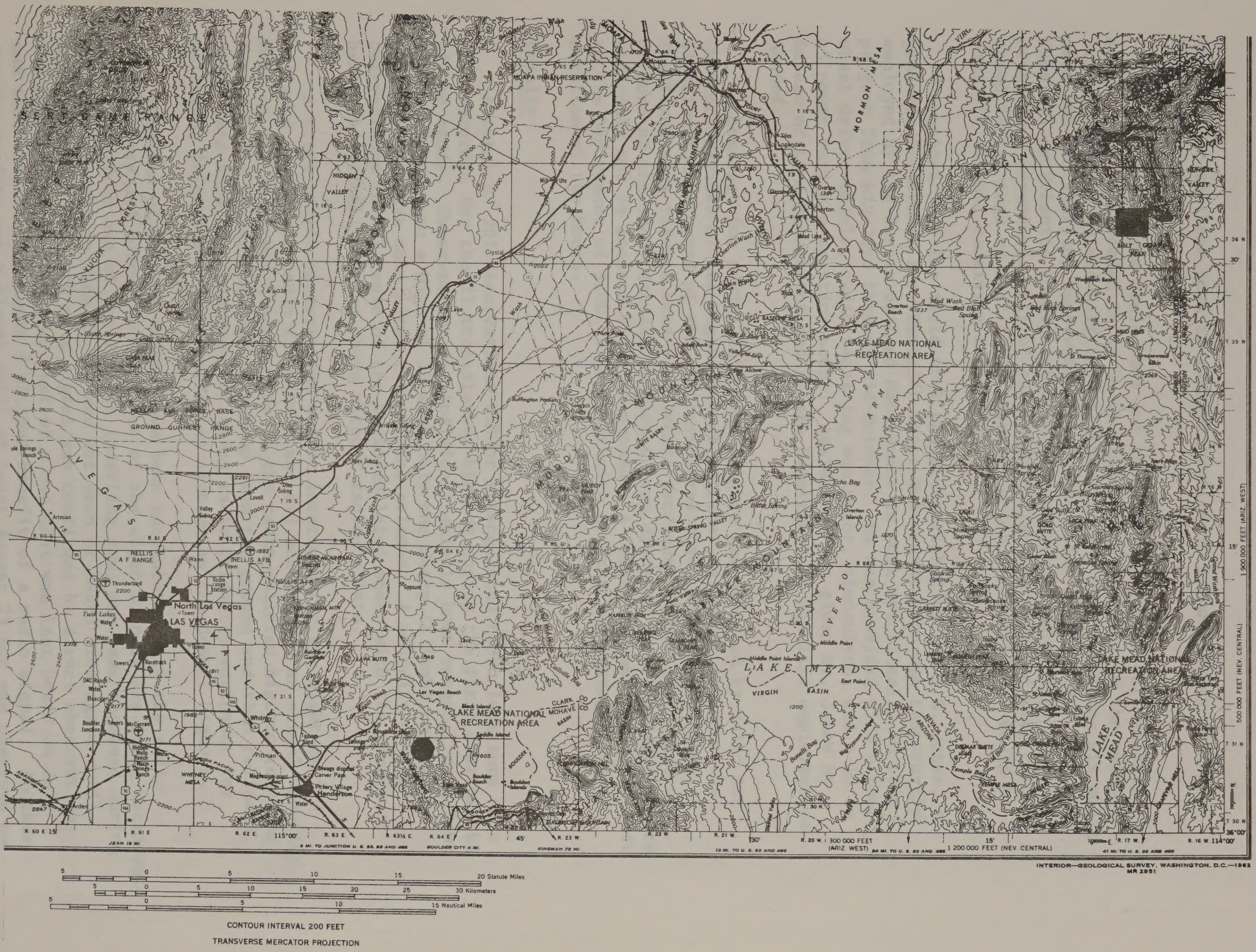
The Virgin Mountains historically supported a relatively large resident population of desert bighorn sheep that were thought to have been extirpated during the 1930's. The specific cause for the decline is unknown although over-hunting and competition (including possible disease introduction) from domestic sheep are suspect. Although sheep were not reintroduced into the area until 1979, the range was identified by Department personnel as a potential reintroduction site in 1951.

A total of 14 desert sheep were captured on the River Mountains on June 17, 1979 and released near Cabin Spring on the Virgin Mountains the same day. Composition of the animals included seven adult ewes, four lambs (three males and one female), and three yearling rams. The transplant was supplemented with an additional seven bighorn captured at the same site on June 23, 1979 consisting of two adult ewes, three lambs (two females and one male), and two yearling rams. All of the 21 bighorn were released in good condition. (See Figure 1)

Procedures and Methods

All of the bighorn released on the Virgin Range were marked with aluminum strap ear tags for permanent individual identification, adults in both ears and lambs in one ear only. Lambs were additionally marked with one highly visable color-coded and numbered T-lock ear tag as a means in aiding field identification of individual animals. All of the markings

Figure 1. Map showing the trap site on the River Mountains (circle) and the release site on the Virgin Mountain Range (square).



are similar to those used in earlier studies of bighorn sheep on the River Mountains.

A total of three adult ewes and three yearling rams were visably marked with color-coded 3¼ by 3¼ aluminum discs attached to the animals around the neck by one-half inch leather straps. The remaining six adult ewes and two yearling rams were fitted with radio transmitters that were supplied by Telonics Incorporated of Mesa, Arizona and packaged by Department personnel. All of the radio collars were fitted with color-coded T-lock tags so that field identification of individuals would be possible without receiving radio signals.

A majority of the field work was accomplished by David C. Jones, a graduate researcher from Humboldt State University, who was temporarily employed by the Bureau of Land Management to work specifically on this project from mid-June through mid-October. He was provided with a four wheel drive vehicle, radio receiving equipment, binoculars, and a 15 to 45 power variable spotting scope. Assistance was given Mr. Jones by Bureau of Land Management and Nevada Department of Wildlife employees as needed.

A contract for aerial follow-up flights was provided by Valko Air Charter Services of Las Vegas, Nevada in order to better document the distribution patterns of the radio-collared sheep on a weekly basis. The fixed wing flights were also deemed necessary in the event that one or more of the sheep decided to move a long distance from the release site and could not be located from the ground. A Cessna 210 was used at a cost to the Department of $100.00 per hour with an expected average flight duration of two hours.

Results

A total of 207 observations and/or triangulated radio locations have been recorded for the 21 transplanted bighorn during the first four months of the study. Observations for individual animals have ranged from a low of one sighting to a high of 35 with only one sheep (a lamb) not being observed at least once after the initial release. A majority of the observations (84.5%) were of the radio-collared sheep with the remainder being individually marked sheep without radio-collars.

A total of 147 observations and/or locations for the eight radio-collared sheep were radio fixes only and did not include an actual sighting. Most of the 28 direct observations of the radio-collared bighorn resulted from a radio signal that was picked up from the ground and then followed. These data show the importance of using radio telemetry equipment for gathering information on a species as elusive as the desert bighorn.

Problems of unknown origin have been encountered with the radio transmitters and currently only four of the eight signals are being received. The signal from one of the animals (yearling ram) was last received during an aerial flight on June 25 and was not seen or heard from again until August 22 when the lack of a signal was confirmed by direct observation. The next malfunction was for that of a ewe that was last heard on July 2 and then observed on August 8 without benefit of a radio signal. Another ewe was sending out a signal until at least August 23 but was observed on

September 6 and also had lost its radio signal. The only other radio collared ram was last heard from on September 13; and it is suspected that the signal has been lost, although the animal has not yet been sighted to document the fact.

The information collected to date from the Virgin Mountain transplant parallels the observations from the Stonewall Mountain follow-up in showing that desert bighorn sheep exhibit a high degree of exploratory behavior when placed into an unfamiliar environment. Even though the release site near Cabin Spring appeared to have all the necessary habitat components required by sheep for survival, most individuals have wandered throughout much of the adjacent habitat. Some of the sheep have remained in suitable terrain away from the release site and appear to have established residency (at least temporarily) whereas others have wandered away for varying lengths of time and later returned. Because of the wide range in individual variation, a brief description of the movement patterns for each radio-collared sheep is presented below. (See Figure 2)

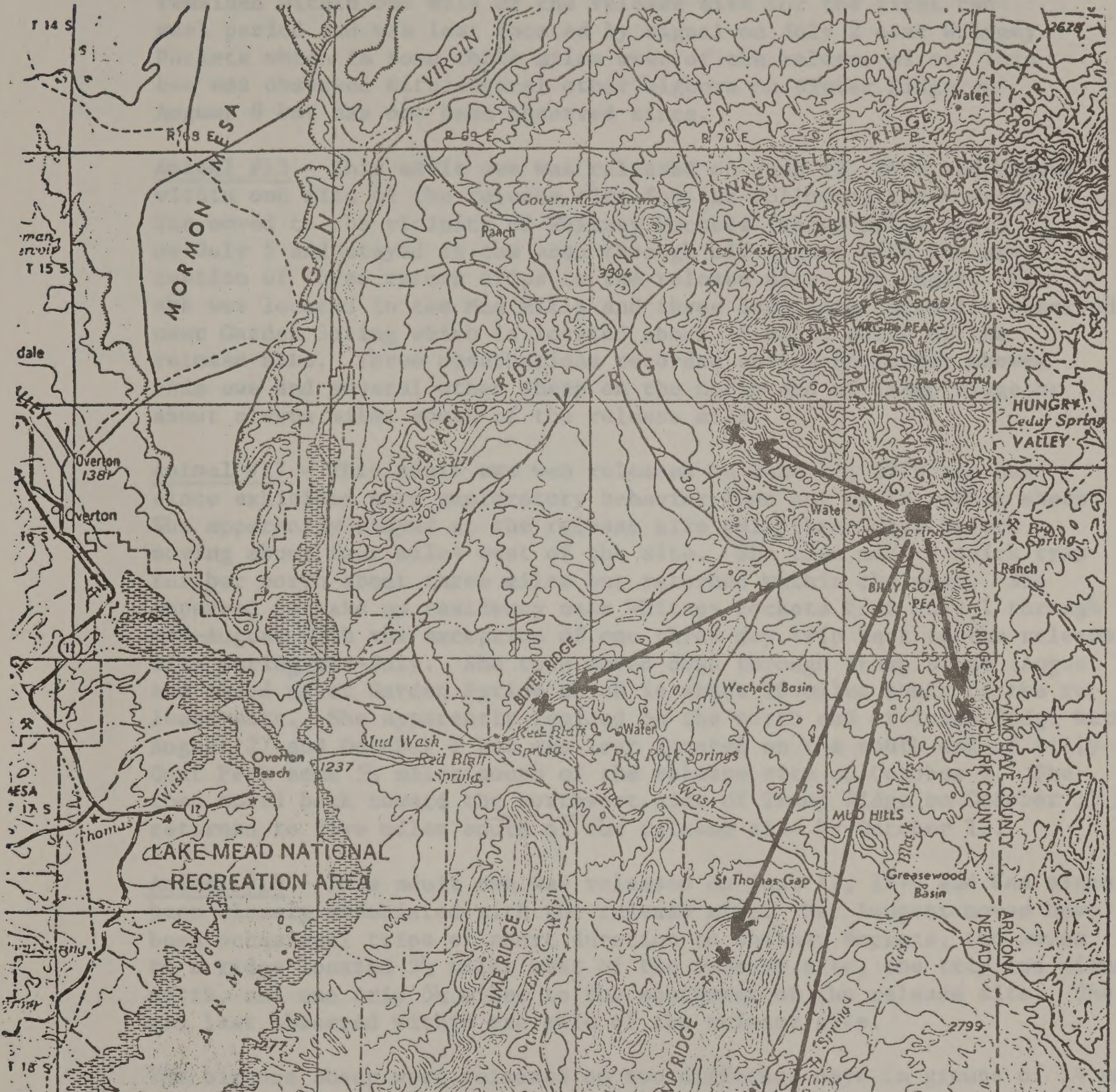
Animal #00 - This is a yearling ram that was captured and released on June 17, 1979. Within six days of the release he moved to the Mud Hills located some six and one half miles south of the release site, spent at least two days, and then returned to within two miles of the release site. Unfortunately, the radio transmitter ceased to function after the first week resulting in a lack of significant data. He was observed, however, on August 22 approximately 3½ miles directly west of the release site and again on October 10 about 9½ miles southwest of the release site.

Animal #02 - This is the only other ram with a radio collar and he was released on June 23, 1979. Two days after the release he was located some nine miles south of the site but moved back to within four miles by June 27. Between July 2 and August 13 he resided with several other sheep on Bitter Ridge which is located some nine miles southwest of the release site. He began to move again by August 22 and was observed some three miles west of the site. Only six days later he was located about ten miles directly south of Cabin Spring (two observations) and returned to Bitter Ridge by September 10. The radio signal was lost on September 13 and the ram has not been sighted since.

Animal #04 - This is an adult ewe that was released on June 23, 1979 and was consistently found within one mile of the site during the following month. She moved with several other sheep to Bitter Ridge (nine miles) sometime around July 26 and has been observed consistently at that location ever since.

Animal #06 - This adult ewe was released on June 17, 1979 and she immediately began to explore the surrounding area. Within the first week she traveled about three miles to the south and then returned to the release site. About one week later she was located about two miles northwest of the release site after which time she disappeared for 18 days. She was again located on July 20, about 13½ miles southwest of the release site and some 5½ miles directly south of Bitter Ridge. Since July 26, she has consistently been observed with a group of sheep on Bitter Ridge.

Figure 2. Major movement patterns of eight radio-collared bighorn sheep released at Cabin Spring on the Virgin Mountain Range.



Animal #09 - This adult ewe was also released on June 17, 1979 but unfortunately lost its radio signal shortly after July 2. She remained within one mile of the release site for the first two week period and was last located by signal on July 2 near Whitney Pockets which is some three miles west of the release site. This ewe was observed with several other bighorn on Bitter Ridge on August 8 but has not been observed since.

Animal #15 - This adult ewe was released on June 17, 1979 and stayed within one mile of the release site for the following three weeks. She moved to the vicinity of Whitney Pockets (three miles west) on July 5 and stayed in the area through mid-August with the exception of three return trips to the release site. On August 20, she was located in the Mud Hills and three days later actually observed near Garden Spring which is located about 16 miles south of the release site. Three observations recorded during September showed this ewe and several other sheep on the north end of Tramp Ridge or about eleven miles south of the release site.

Animal #17 - This adult ewe was released on June 17, 1979 and has since exhibited more exploratory behavior than any of the other sheep. She apparently stayed at the release site only three days before moving about four miles west of the site. She then made a quick trip further north about three miles but returned within the week. She appeared to take up residency near Whitney Pockets from July 1 through mid-August with the exception of one three day trip back to the release site during mid-July. She then moved down through Tramp Ridge (August 20) and ended up at Garden Spring which is about 16 miles south of the release site. She apparently resided on the north end of Tramp Ridge between August 27 and October 1 but was last located on the south end of Billy Goat Peak some 5½ miles south of the release site on October 9. She then moved back toward the northwest side of Tramp Ridge on October 15 and returned to five miles south of the release site by October 17.

Animal #19 - This adult ewe was released on June 17, 1979 and has since been closely associated with the release site. Her longest moves have been occasional trips of short duration to Whitney Pockets, two moves to a ridge located 5½ miles west of the release site, one trip two miles north, and one trip 5½ miles to the southwest of the release site. She was last observed within one mile of the release site.

The bighorn sheep were released on two different days in groups of 14 and seven individuals respectively. Direct observations since that time indicate an average group size of 4.0 sheep per band ranging from a low of two in one group to a high of six in another. There is no apparent group cohesion established with the exception of five lambs (out of seven total) that are consistently found with five individual ewes. It is suspected that the two other lambs may have been captured without their respective mothers; and are, therefore, somewhat "orphaned." The lack of group cohesion parallels that data from the River Mountains that showed almost random mixing of individual animals in the population.

Although the sheep have not yet established specific home range patterns in select areas there appears to be three major use areas that are preferred. Approximately one-third of the animals are located within two miles of the release site, one-third are normally found on Bitter Ridge, and the remaining one-third are either on the north end of Tramp Ridge or unaccounted for. It is suspected, however, that more movement will occur during the next year.

A summary of the movements for the radio-collared sheep is presented in Table 1 for comparative purposes. These data show that bighorn are highly exploratory when placed into an unfamiliar environment with individual movements of several miles being common. None of the bighorn remained near the release site at all times, although several did return to the original site after exploring the adjacent habitat.

Table 1. Summary of the movement patterns for all radio-collared sheep released on the Virgin Mountain Range.

Animal Number	Sex	Age	Number of Locations and/or Observations	Average Distance Between Observations	Longest Distance Moved
00	♂	1 1/2	5	3.7 miles	9.8 miles
02	♂	1 1/2	16	3.1 miles	11.0 miles
04	♀	Adult	27	1.0 miles	11.1 miles
06	♀	Adult	23	1.5 miles	13.5 miles
09	♀	Adult	9	1.6 miles	10.9 miles
15	♀	Adult	28	1.2 miles	16.0 miles
17	♀	Adult	33	1.3 miles	16.0 miles
19	♀	Adult	29	1.5 miles	5.7 miles

Discussion

All of the transplanted bighorn sheep were released at Cabin Spring on the Virgin Range because of their suspected need for free water that resulted from temperatures in excess of 100 degrees. It is interesting to note, however, that there was no documented use by bighorn sheep at the spring site during the first three weeks after the release and then only occasional sign at the spring during the remainder of the summer. Although it is suspected that the bighorn found free water in the form of a natural catchment or weak seep, no addtional waters could be located. It is possible that the bighorn obtained enough water from green forage to survive although it would be highly unlikely in view of the long-range movements that occurred after the release.

Those bighorn that moved to the vicinity of Bitter Ridge were associated with Red Bluff Spring and were actually observed drinking at the site. Sign near the spring showed that the animals utilized the spring source regularly during the warmer months of the summer. It is suspected that those bighorn located 16 miles south of the release site also utilized Garden Spring although none were observed directly at the site drinking.

Approximately three weeks after the release, heavy rains were received throughout the Virgin Mountain area which filled many natural catchments with water. Whitney Pockets, for example, provided sufficient water for bighorn sheep from mid-July through the end of the summer. It is possible that with the exception of Bitter Ridge, that bighorn were able to use water from the natural catchments; and, therefore, did not need waters produced at the known permanent springs.

There have been no documented mortalities to date and random observations suggest that none have occurred. All but one of the radio collared sheep have been observed after September 1 and the one not observed has a nonfunctional transmitter which makes locating the individual difficult. Also, 10 of the 13 sheep without radio collars have been observed since September 1 which is considered quite an accomplishment because of the wide dispersal patterns. The sheep have passed the critical summer season in apparent good condition and are expected to survive the winter months with few problems.

Habitat Evaluations

In addition to the follow-up of transplanted sheep a major objective is to determine habitat use patterns by the introduced population. To meet this study objective a range survey for the entire Virgin Mountain release area, including mapping of major vegetative communities and calculations of forage production, was completed.

A thorough water resources inventory was conducted with the aid of a helicopter. Locations of usable water sources were documented.

A topographic index of the release site area was completed. The index will be used as a means of measuring bighorn sheep escape cover requirements.

Fecal pellet collections were initiated to be used in a fecal analysis for determination of forage selectivity and preference. To-date only a few collections have been made, however, following stabilization of the introduced population more emphasis will be placed on this job.

Recommendations

It is recommended that the proposed Quarterly Reports be changed to semi-annual documents because of the time needed to analyze the data and describe the results. Also, the amount of data collected will certainly

be decreased because of the termination of the graduate researcher from Humboldt State University during the winter season. There will probably be little to report other than a few radio locations until early next summer.

It is recommended that the follow-up flights be continued on a monthly basis through the winter season in order to document the distribution patterns of the radio-collared bighorn. Field time, however, will necessarily be limited during the next several months because of other job conflicts. It is imperative that field time be expended during late February and early March in order to document lamb production and possible early mortality. If we wait until early summer to begin ground observations, there is a chance that lambs will be produced that do not survive. We particularly need to document lamb production in addition to survival because of the release of only yearling rams in the transplant. Although we know that yearling rams will accomplish successful breeding in captive herds, we are only speculating that they will do the same when in the wild.

Submitted by: ______________________________ Date: ________________

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